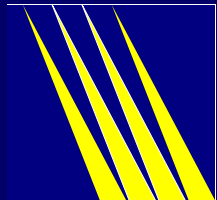


# EPA Energy Star

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## Impact on Performance Contracting

Boston, MA  
January 20, 2005



NAESCO



# Agenda

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- ESCO Business Environment
- EPA Provides Help
- Portfolio Manager
- Cash Flow Opportunity Calculator



# Energy Office Challenges

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- Budgets shrinking
- Resources scarce
- Buildings need attention
- Energy costs are increasing as a percentage of overall operating costs
- Savings mandates



# ESCO Project Challenges

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- Long project sales cycle
- Financial decisions baffling
- Little buyer recognition
- Hard to sell ongoing relationships



# Challenge: Sales Cycle

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- Difficult selling through organization
- Threat to buyers
  - “A good job is already being done”
- Hard to establish credibility
  - Don’t believe savings potential
  - Require expensive feasibility studies



# Challenge: Financial Decisions

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- Puzzling complex deals
  - Unfamiliar contracts, terms and risks
- Ignore costs of delays
  - Volatile utility costs
  - Volatile interest rates
- Excuses
  - Rates could decline
  - Government could finance directly



# Challenge: Little Recognition

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- Projects largely invisible
  - Only problems obvious
- No rewards for risk-taker
  - Facility manager
  - Agency financial official
- Little self-promotion for operating savings



# Challenge: Relationships

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- Compete for each project
- Buyers not loyal to hardware
  - Controls
  - Lighting
  - HVAC
- Buyers do not operate buildings well



# EPA Provides Help

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- [www.energystar.gov](http://www.energystar.gov)



# Energy Costs in Context

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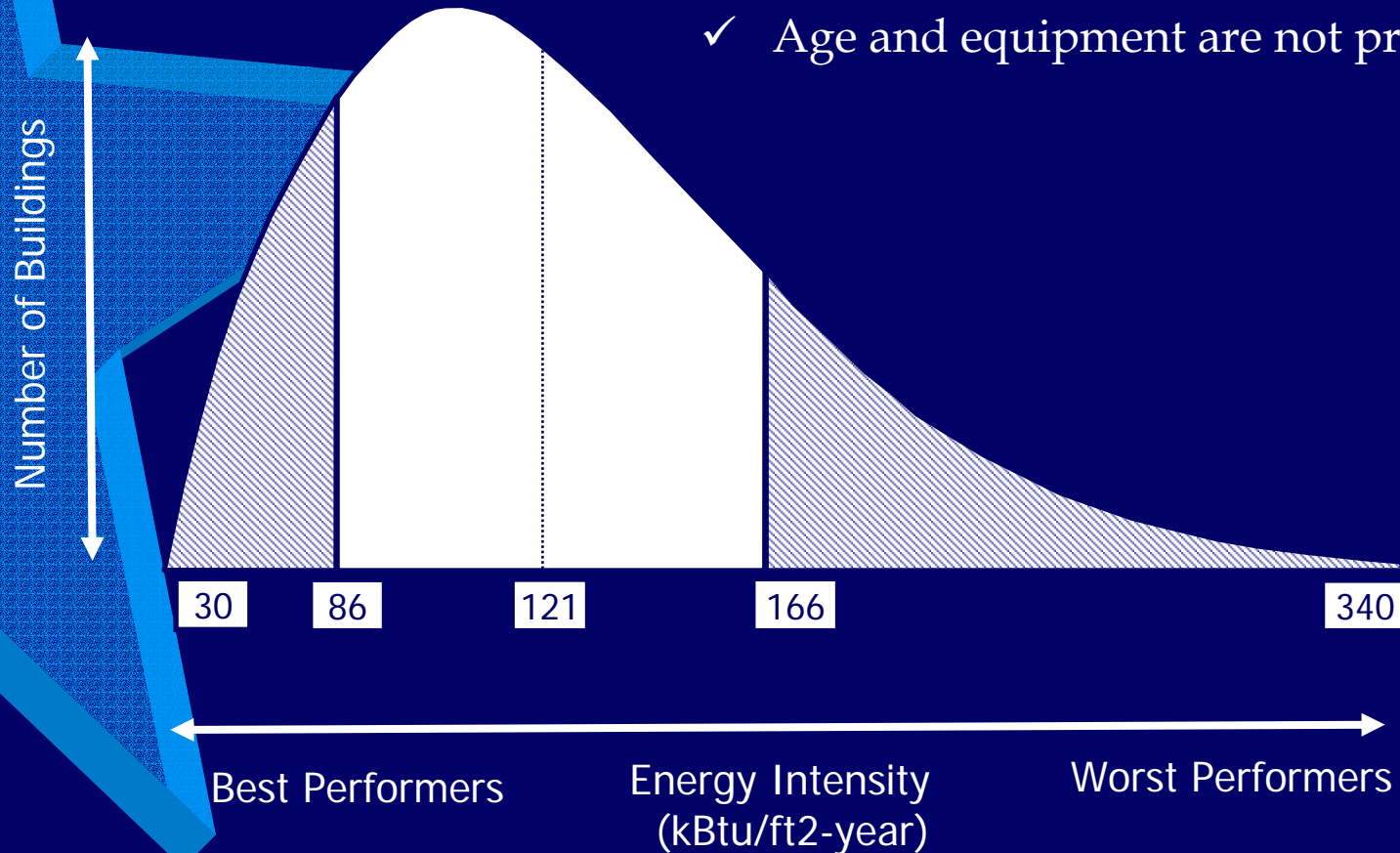
## Commercial Sector

- 30% of energy used is “waste” energy
- Devoted 30% of operating budgets to energy
- Generates 17% of US CO<sub>2</sub> emissions

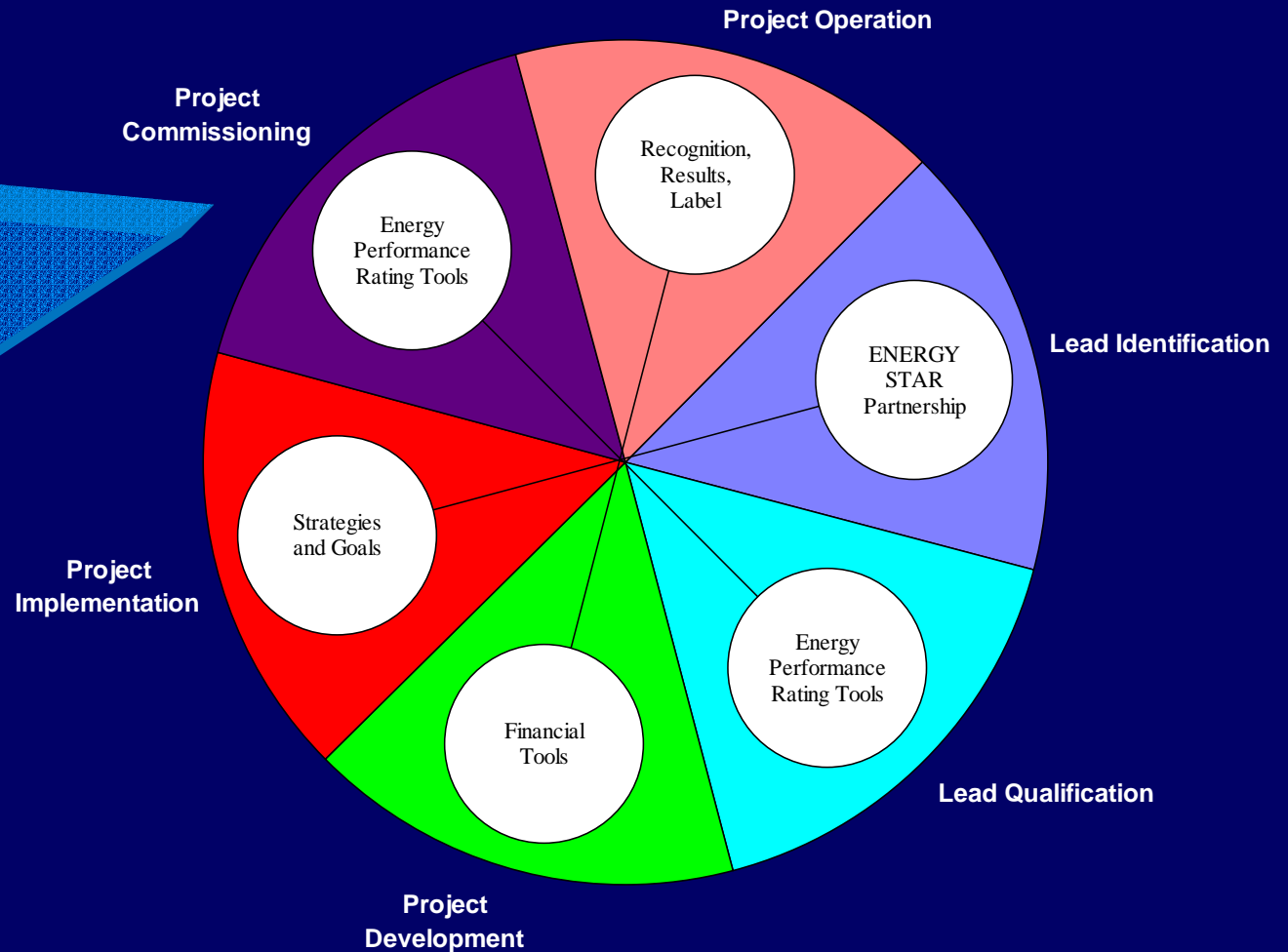


# Huge Variation in Energy Performance

- ✓ Normalized energy intensity varies
- ✓ Age and equipment are not predictors



# Energy Star Tools

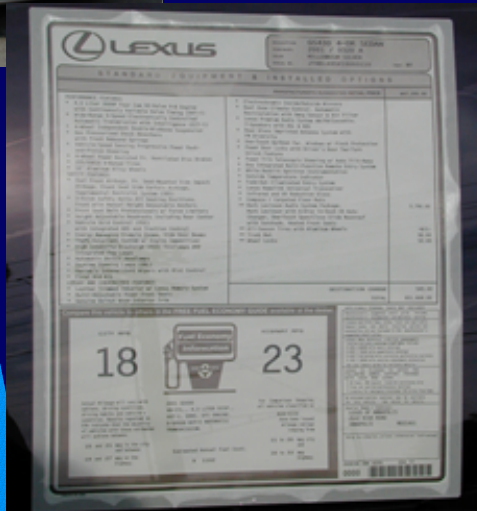


# National Energy Performance Rating

Is 10 MPG high or low for an automobile?



Fuel  
Efficiency  
MPG



Is 80 kBtu/SF/YR high or low for a building?



Energy  
Efficiency  
1 - 100

STATEMENT OF ENERGY PERFORMANCE			
Medium Office Building			
Building ID: 20111			
For 12-month Period Ending: January 31, 2014 <sup>1</sup>			
Date SEP Generated: February 05, 2014			
<b>Medium Office Building</b> 327 Old Town Blvd Nashville TN 37203 Gross Building Area: 247,500 sq ft Year Built: 1986		<b>Owner</b> JPFC Customer Contact: Robert Williams 327 Old Town Road Nashville TN 37203 (615) 259-8542	
<b>Facility Space Use Summary</b>			
Space Type	Area(sq ft)	Occupants	Operating hours/week
Computer Data Center	7,500	NA	NA
Garage	75,000	0	NA
Office (General)	240,000	952	80
<b>Site Energy Use Summary</b>			
Electricity (kBtu)	13,050,579		
Natural Gas (kBtu)	2,957,809		
<b>Total Energy (kBtu)</b>	<b>16,008,388</b>		
<b>Professional Verification</b> Bill LaRue 5000 Lee Hwy Franklin TN 37067 760-934-3559 License Number: 1234567X State: TN			
<b>Results</b>			
<b>Energy Performance Rating<sup>2</sup> (1-100)</b>		<b>85</b>	
<b>Energy Intensity<sup>3</sup></b>			
Site (kBtu/sq ft)	73.6		
Source (kBtu/sq ft)	145.6		
<b>Emissions</b>			
CO <sub>2</sub> (1000 lbs/yr)	38,133		
SO <sub>2</sub> (1000 lbs/yr)	916		
NO <sub>x</sub> (1000 lbs/yr)	547		
<b>Energy Cost</b>			
Cost (\$/yr)	\$427,654		
Intensity (\$/sq ft)	\$1.91		
<b>Indoor Environment Criteria<sup>4</sup></b>			
Indoor air pollutants controlled?	Yes		
Adequate ventilation provided?	Yes		
Thermal conditions met?	Yes		
Adequate illumination provided?	Yes		
<b>Notes</b>			
1. Application for ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of ENERGY STAR is not final until approval is received from EPA.			
2. An energy performance rating of 75 is the minimum required rating to be considered eligible for ENERGY STAR.			
3. Values represent energy intensity, annualized to a 100 day calendar.			
4. Based on meeting ASHRAE Standard 55-1982 for indoor air quality, ASHRAE Standard 55-1982 for thermal comfort, and IESNA Lighting Handbook for lighting quality.			
Tracking Number: SEP20140205001003783			



# National Energy Performance Rating

---

- Normalizes building energy consumption
  - Weather, hours, occupant density, plug load
  - Whole building “mpg” rating
- Benchmarks for comparison
  - Similar buildings in national stock
- Recognizes top performing buildings
  - Top 25% qualify for ENERGY STAR



# National Energy Performance Rating

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- National
- Ratings of 1-100
- Simple qualifying
- Customers can confirm ratings



# Eligible Space Types

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Supermarkets

Offices

K-12 Schools

Hospitals

general, courthouse,  
bank branch, financial  
center

Medical Offices

Hotels

Post Offices

Warehouses

Residence Halls/  
Dormitories







# Required Information

---

- **Address**
  - Zip Code for weather normalization
- **Energy Consumption**
  - 12 consecutive months for each source
- **Space Type Data**
  - Industry specific
    - K-12 Schools
      - Square footage, hours of operation, number of PCs, occupancy



## Use the Rating to:

---

- Establish portfolio baseline
- Set goals
- Track performance over time
- Verify gains from upgrade efforts



# Large-scale Benchmarking

---

- States
  - CA Green Building Initiative
  - KS K-12 schools
- Trade organizations
  - SACIA in Southwest Connecticut



# Changing the Marketplace

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- Motivates large populations of customers who are difficult to reach efficiently
  - State and local government facilities
- Creates momentum for projects
  - Keep up with competitors or other agencies
  - Avoid public embarrassment
  - Validates proprietary tool results
- Provides a uniform, verifiable scorecard

# Calculating the Cost of Delay

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# Cash Flow Opportunity Calculator

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- Simple to use
- Illustrates cost of delay
- Customers can confirm results
- Answers...
  - How much equipment can be purchased from savings
  - Whether it is better to wait and use future cash
  - If money is being lost waiting for better interest rate

# Cash Flow Opportunity Calculator

**ENERGY STAR® CASH FLOW OPPORTUNITY Calculator**  
from the US Environmental Protection Agency.

**This spreadsheet is designed to work with Microsoft Excel 97 or later versions. It may not work properly with earlier versions. It is best viewed with 1024x768 pixels resolution.**



**ENERGY STAR®  
CASH FLOW  
OPPORTUNITY**

**Version 1.1**

Please send any comments to Melissa Payne, ENERGY STAR National Manager, at [payne.melissa@epa.gov](mailto:payne.melissa@epa.gov).

[Disclaimer](#)

# CFOC: Overview

## FIRST APPROXIMATION DATA ENTRY TABLE

**Name**

**Select Scenario**

**Sample Values**

Uses existing data

	SF	Annual Energy Costs (\$) - All Fuel Types	\$/SF		Annual Savings	Buildings cost
Group A	200,000	100,000	0.50	15	\$15,000	LESS than \$1.00 /SF to operate
Group B	800,000	900,000	1.1	30	\$270,000	MORE than \$1.00 /SF to operate
	Total SF	Total Energy Cost (\$) - All Fuel Types	\$/SF	Weighted Savings Target (%)	Total Potential Annual Savings (\$)	
	1,000,000	1,000,000	1.00	28.50%	285,000	

ENERGY STAR® does not guarantee that your project will generate the results presented herein. An investment grade audit performed by a qualified engineering organization is required to determine the actual size of your savings opportunity.

Intro

Instructions

**Data Entry**

Investment Values

Cash Flow

Cost of Delay

Summary



# CFOC: Investment Value

## FIRST APPROXIMATION INVESTMENT OPPORTUNITY

	Group A	Group B	Total Utility Bill
Annual Utility Bills	\$100,000	\$900,000	\$1,000,000
Annual Potential Savings	\$15,000	\$270,000	\$285,000
Potential Annual Savings = Cash Flow Opportunity			

Use Sample Values

### What Can This Annual Cash Flow Buy?

Calculate

Assuming an interest rate of	5.00	%	You may change these values anytime. If you would like to see the sample values, please click on the Use Sample Values button.
Assuming a term of	7	Year(s)	
Savings used to pay energy investments	90	%	

Taken from operating funds, these savings could finance energy projects equal to:

without increasing today's capital and operating budgets.

Contribution that your operating budget can make towards energy improvements

/SF

Median project investment ranges between \$1 - 3/ft<sup>2</sup>.\*

Simple Payback

Year(s)

Consider blending short- and long-term projects to maximize use of the savings.

Month(s)

\*Market Trends in the U.S. ESCO Industry: Results from the NAESCO Database Project ([http://www.naesco.org/ESCO\\_Mkt\\_Trends\\_final.pdf](http://www.naesco.org/ESCO_Mkt_Trends_final.pdf)), May 2002

Disclaimer

# CFOC: Investment Value

FIRST APPROXIMATION INVESTMENT OPPORTUNITY			
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Potential Annual Savings = Cash Flow Opportunity			
<input type="button" value="Use Sample Values"/>		<input type="button" value="Calculate"/>	
What Can This Annual Cash Flow Buy?			
Assuming an interest rate of	5.00	%	You may change these values anytime. If you would like to see the sample values, please click on the Use Sample Values button.
Assuming a term of	7	Year(s)	
Savings used to pay energy investments	90	%	
Taken from operating funds, these savings could finance energy projects equal to,		without increasing today's capital and operating budgets.	
		<b>\$1,512,000</b>	
Contribution that your operating budget can make towards energy improvements		/SF	Median project investment ranges between \$1 - 3/m <sup>2</sup> .*
Simple Payback		Year(s)	Consider blending short- and long-term projects to maximize use of the savings.
		Month(s)	
<small>*Market Trends in the U.S. ESCO Industry: Results from the NAESCO Database Project (<a href="http://www.naesco.org/ESCO_Mkt_Trends_final.pdf">http://www.naesco.org/ESCO_Mkt_Trends_final.pdf</a>), May 2002</small>			
<a href="#">Disclaimer</a>			

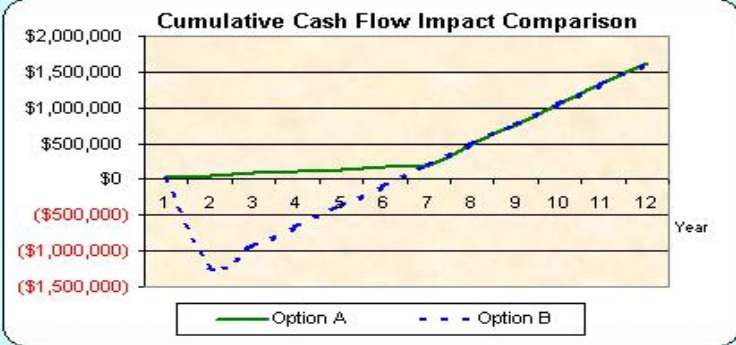
# CFOC: Simple Payback

## FIRST APPROXIMATION CASH FLOW OPPORTUNITY

Click this button if you would like to transfer values from Investment Values page. Year(s) postponed is given as 2 years.

Use Investment Values

Project cost	1,512,000	\$
Simple payback	5	years
	4	month(s)
Interest rate	5.00	%
Financing term	7	years
Year(s) postponed	1	



Option A (Fast Track Financing)					Option B (Waiting for Cash)			
Year	Savings	Cost	Annual Cash Flow	Cumulative Cash Flow	Savings	Cost	Annual Cash Flow	Cumulative Cash Flow
0	\$285,000	(\$256,446)	\$28,554	\$28,554	\$0	\$0	\$0	\$0
1	\$285,000	(\$256,446)	\$28,554	\$57,109	\$285,000	(\$1,512,000)	(\$1,227,000)	(\$1,227,000)
2	\$285,000	(\$256,446)	\$28,554	\$85,663	\$285,000	\$0	\$285,000	(\$942,000)
3	\$285,000	(\$256,446)	\$28,554	\$114,217	\$285,000	\$0	\$285,000	(\$657,000)
4	\$285,000	(\$256,446)	\$28,554	\$142,772	\$285,000	\$0	\$285,000	(\$372,000)
5	\$285,000	(\$256,446)	\$28,554	\$171,326	\$285,000	\$0	\$285,000	(\$87,000)
6	\$285,000	(\$256,446)	\$28,554	\$199,880	\$285,000	\$0	\$285,000	\$198,000
7	\$285,000	\$0	\$285,000	\$484,880	\$285,000	\$0	\$285,000	\$483,000
8	\$285,000	\$0	\$285,000	\$769,880	\$285,000	\$0	\$285,000	\$768,000
9	\$285,000	\$0	\$285,000	\$1,054,880	\$285,000	\$0	\$285,000	\$1,053,000
10	\$285,000	\$0	\$285,000	\$1,339,880	\$285,000	\$0	\$285,000	\$1,338,000
11	\$285,000	\$0	\$285,000	\$1,624,880	\$285,000	\$0	\$285,000	\$1,623,000
Net Present Value of Option A					Net Present Value of Option B			
\$1,042,136					\$883,170			

For purposes of this calculation, all cash flows are being discounted at the interest rate indicated in cell G7 - financing paid monthly in arrears.

Disclaimer



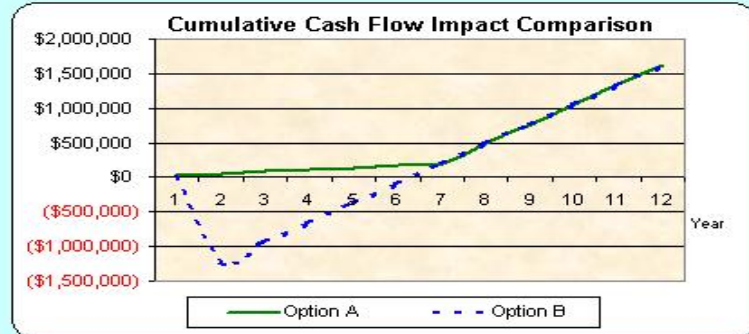
# CFOC: Net Present Value

## FIRST APPROXIMATION CASH FLOW OPPORTUNITY

Click this button if you would like to transfer values from Investment Values page. Year(s) postponed is given as 2 years.

Use Investment Values

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Simple payback	5	years
	4	month(s)
Interest rate	5.00	%
Financing term	7	years
Year(s) postponed	1	



Option A (Fast Track Financing)					Option B (Waiting for Cash)			
Year	Savings	Cost	Annual Cash Flow	Cumulative Cash Flow	Savings	Cost	Annual Cash Flow	Cumulative Cash Flow
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1	\$285,000	(\$256,446)	\$28,554	\$57,109	\$285,000	(\$1,512,000)	(\$1,227,000)	(\$1,227,000)
2	\$285,000	(\$256,446)	\$28,554	\$85,663	\$285,000	\$0	\$285,000	(\$942,000)
3	\$285,000	(\$256,446)	\$28,554	\$114,217	\$285,000	\$0	\$285,000	(\$657,000)
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10	\$285,000	\$0	\$285,000	\$1,339,880	\$285,000	\$0	\$285,000	\$1,338,000
11	\$285,000	\$0	\$285,000	\$1,624,880	\$285,000	\$0	\$285,000	\$1,623,000
Net Present Value of Option A					Net Present Value of Option B			
\$1,042,136					\$883,170			

For purposes of this calculation, all cash flows are being discounted at the interest rate indicated in cell G7 - financing paid monthly in arrears.

**\$1,042,136**

**\$883,170**

# CFOC: Break-Even Point

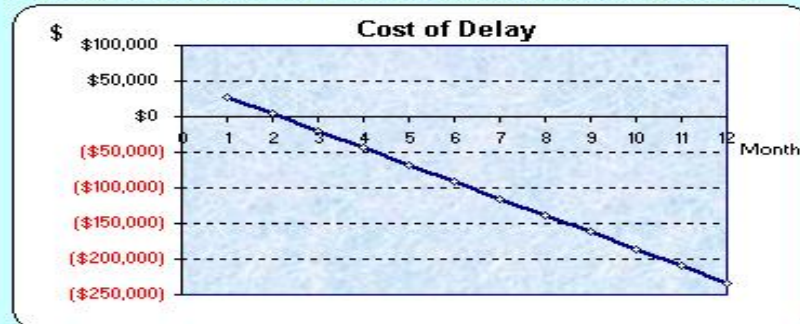
## FIRST APPROXIMATION COST OF DELAY

Comparative Interest Rate Analysis		Use Cash Flow Values
Interest rate of immediate financing	5.00	%
Interest rate of a lower financing	4.00	%
Cost of the equipment	\$1,512,000	
Simple payback	5	year(s)
Potential annual savings	4	month(s)
Term of financing	\$285,000	
Lower interest rate savings	7	year(s)
Break-Even Point	\$51,400	
Opportunity cost if delayed 12 months*	\$23,800	/ month
	2.2	month(s)
	15.4%	

Break-Even Point

2.2

\*The opportunity cost is 12 months of lost savings divided by the original project cost.



Month	Balance at beginning of month	Amount lost in monthly utility bills	Balance at end of month
1	\$51,400	\$23,800	\$27,700
2	\$27,700	\$23,800	\$3,900
3	\$3,900	\$23,800	(\$19,800)
4	(\$19,800)	\$23,800	(\$43,600)
5	(\$43,600)	\$23,800	(\$67,300)
6	(\$67,300)	\$23,800	(\$91,100)
7	(\$91,100)	\$23,800	(\$114,800)
8	(\$114,800)	\$23,800	(\$138,600)
9	(\$138,600)	\$23,800	(\$162,300)
10	(\$162,300)	\$23,800	(\$186,100)
11	(\$186,100)	\$23,800	(\$209,800)
12	(\$209,800)	\$23,800	(\$233,600)

To see values from the Cash Flow worksheet, click the Use Cash Flow Values button in the upper right corner of this sheet. To close the spreadsheet, simply click the Save & Exit button on the CFO Calculator toolbar.

[Disclaimer](#)

# CFOC: Opportunity Cost

FIRST APPROXIMATION COST OF DELAY			
<b>Comparative Interest Rate Analysis</b>		<b>Use Cash Flow Values</b>	
Interest rate of immediate financing	5.00	%	
Interest rate of a lower financing	4.00	%	
Cost of the equipment	\$1,512,000		
Simple payback	5	year(s)	
	4	month(s)	
Potential annual savings	\$285,000		
Term of financing	7	year(s)	
Lower interest rate savings	\$51,400		
Amount lost in utility bills	\$23,800	/ month	
Break-Even Point	2.2	month(s)	
Opportunity cost if delayed 12 months*	15.4%		

Month	Balance at beginning of month	Amount lost in monthly utility bills	Balance at end of month
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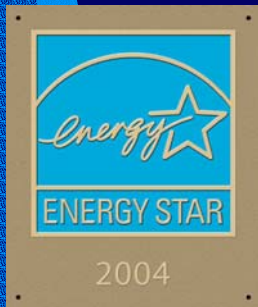
[Disclaimer](#)



# ENERGY STAR: Recognition Awards

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ENERGY STAR Building Identification



National Awards & News Releases



Use of EPA Promotional Materials

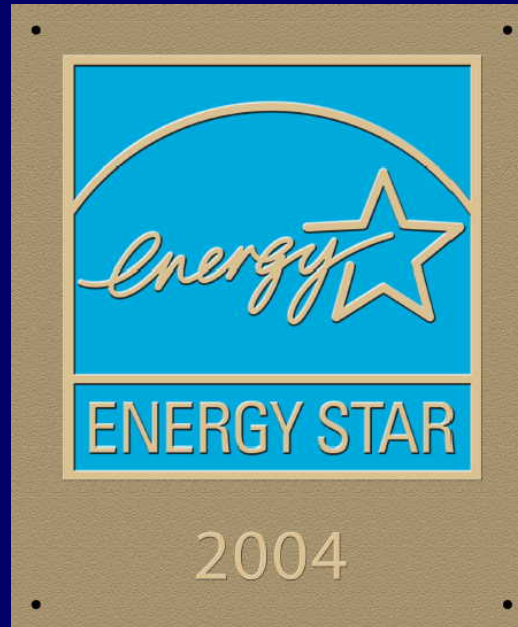


# ENERGY STAR Label

Satisfy  
Eligibility  
Requirements

Rate Facility  
Performance

Energy  
Performance  
Rating 75 to 100



Obtain PE  
Verification

Submit SEP  
& Application

Those that qualify  
are in the top 25%  
of the market



# ENERGY STAR Building Profiles

## Service Provider:

Trane - Detroit District

Year Labeled: 2001

Score (by years): 77

Space Type: Office

Total Floorspace: 660,000 sf

Year Constructed: 1975

Energy Intensity: 74 kBtu/sf/yr

Contract Type: Unavailable

## Technologies Used:

Stage 1-Commissioning

Stage 2-Lighting

Stage 4-Fan Systems

Stage 5-Heating and Cooling

Plant

## American Center Building

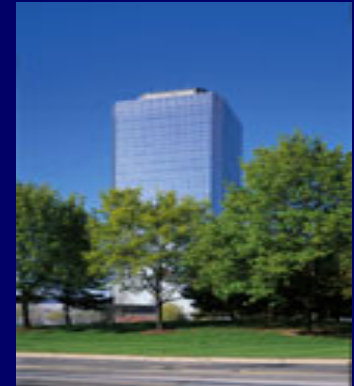
27777 Franklin Rd.

Southfield, MI 48034

The American Center building is a premier 25-story office tower that includes a state-of-the-art conference center and an integrated retail and service complex.


The building was constructed in 1975 for American Motors Corporation. Over \$5 million was spent on renovations to the American Center both cosmetically and mechanically. The mechanical renovations, at a cost of \$3,253,186 have a payback of 5 years with a yearly savings of over \$620,000 and allowed the building to qualify as an ENERGY STAR building.

To qualify as an ENERGY STAR building, the American Center replaced its original lighting fixtures, which were a fluorescent F-40 Four lamp with two standard magnetic ballasts. The new light is a Silver Reflector and 2 F-32/T8 lamps and electronic ballast. REDICO also changed the HVAC system to operate with a Variable Air Volume system with Variable Frequency Drives on the main fans. The electric boilers were replaced with high efficiency Lochinvar gas boilers lobby was changed to hot water baseboard heat. Two new Trane chillers were installed and a Variable Frequency Drive was installed on the domestic boost pump system. Finally, a Trane Tracer energy management system was installed.



# EPA Resources: Suite of Tools

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- 
- Portfolio Manager
  - QuikScope
  - Financial Value Calculator
  - Cash Flow Opportunity Calculator
  - Delta Score Estimator



# Thank You

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NAESCO/Predicate

781.793-0250

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[www.energystar.gov](http://www.energystar.gov)